

Photo: Schmid



Dr. Christian Buchner is Head of Business Unit Photovoltaics at Schmid.

“Revival within the equipment industry”

Interview: During the period of oversupply within the PV sector it was often said that rumors of the death of PV were greatly exaggerated. However, are reports of an equipment supply recovery similarly overstated? Christian Buchner, Head of Business Unit Photovoltaics at Schmid, does not believe that is the case, as a wave of new technology uptake and manufacturing capacity expansions begin to fill order books once more.

What do you make of the global PV manufacturing landscape at present, from your perspective as a production equipment supplier?

I don't think that manufacturers are making large amounts of money because prices have come down so much. It is very difficult with cell and module manufacturing to make money these days, and it is the same on the equipment side. All companies have to work really hard to bring in revenues and also to achieve healthier margins.

From an equipment perspective we have a lot of competition from within China that still presents a very big challenge in terms of price. So it is difficult but I think if you do a good job, it is possible to make money again in this market.

What about for manufacturers, what is the role of technology in terms of increasing margins and also for long-term success?

I think the role of technology is very important right now. The existing technology – the standard manufacturing as we have seen it over the last six years – is about to end. This is because manufacturers have to adopt new technologies, like rear-side passivation, bifacial technology, and multi-busbar approaches. We think technologies like these will be the future because the old technologies are about to end at the efficiency levels we see today.

You mention multi-busbar technology. Why is this technology important?

First of all we have developed a standard stringer that uses the common soldering technology that has been established within the PV industry for many years now. The difference is though that we changed the three-or-four busbar configuration to standard copper wires. Hence the number of busbars is increased to up to 12.

Looking at the electrical properties of the cells, that is the optimal number of busbars that have to be used to get the best output. At Schmid we have seen this! We have customers already using this technology in module production and they report 5–7 W higher output by simply changing from standard ribbon busbars to multi-wire technology.

But how big of a change is that to a module producer's floor-plan and production flow?

The change is reasonably minimal. What simply needs to be exchanged is an existing stringer for a multi-busbar stringer. That means that the footprint on a line does not need to change. It is easy to adopt because it is the same soldering technology and cells can be ordered with the altered front side electrode required for the 12 busbars from any suppliers. The cell manufacturer itself simply needs to change the screen used in manufacturing to produce the electrode required for multi-busbar production.

Additionally, the fact that the cell requires less silver means silver costs can be reduced by more than half, and it is another big advantage in terms of cost.

Does Schmid supply the copper wire itself, or simply the busbar tool?

Schmid supplies the tool. The copper wire is standard copper wire that can be sourced everywhere in the electronics industry. In fact there are more sources for the copper wire than there are for the ribbon supplied today.

Schmid is also pushing bifacial technology at the moment. However, we are really seeing major PERC adoption in the market and it is an either/or choice for a manufacturer. Why is it that you see bifacial technology making an impact?

This is not a straightforward answer! Looking at the end-user

market, half of the downstream business is in the ground-mounted segment. Here EPCs and developers are predominantly using multicrystalline modules, either in 60 or 72-cell modules. These types of modules have almost reached the top of what can be achieved in terms of efficiency today, which is 250 W to 280 W at the top end.

The next step is really far away to get to higher efficiency levels. There has to be a major change in the technology or simply stay at today's level of efficiency. Given this, bifacial technology is around the same manufacturing costs, but the rear side of the cell is opened up to light and it increases energy harvest by up to 30%.

Just imagine if a manufacturer was trying to increase the front side efficiency by 30% – it is simply not possible!

Bifaciality is the key to increase energy harvest – this is the first advantage. The second advantage is that the same production line, which Schmid supplies to its customers, can also manufacture a rear side passivation solar cell. This means producers can even supply the rooftop market with a so-called PERT cell. This cell employs rear-side passivation but is totally diffused rather than simply applying aluminum oxide on the rear side. It is the same line – the same product like PERC – and a manufacturer can simply decide whether to go one way or the other. There are even more advantages when working with mono products. The Schmid line can produce a p-type bifacial mono – multicrystalline also – but also n-type. N-type can simply be fed into the line producing n-type bifacial cells that can deliver 330 W modules, as the prices of n-type material comes down.

However, the measurement challenges with bifacial modules (pv magazine 04/15) still exist in that a standard for measuring the bifacial boost has yet to be locked in. How big a challenge is this for Schmid in pushing bifacial technology?

This is an important point. We feel that not enough has been done in this area for a number of years. At present there is no standard test condition because the market is not educated about the higher benefits that can be attained through bifacial technology.

Schmid is currently working with companies and organizations like Halm, TÜV, University of Constance, and the IEC, to get together to define the standard test condition to really ascertain the value of a bifacial module.

Looking at the market for production equipment suppliers, it has been a difficult few years with rather bare order books. How has Schmid managed to stay in the market?

Schmid did sell some equipment during the periods of weak demand in the area of technology upgrades, not only for crystalline silicon manufacturers but also in the thin film area. That was nowhere near the levels in 2009 and 2010 of course.

The second advantage that Schmid has is that it is quite diversified. In the 1970s Schmid moved into the printed circuit board (PCB) equipment market. During the years of weak PV demand, we have seen a very strong PCB market. The PCB market has been a big advantage to internally cross-finance our PV activities, particularly in terms of R&D, which we have maintained.

Did you ever have conversations with owner Christian Schmid in which he asked, "Why are we still in this PV business?"

No, that was never in doubt. Christian Schmid is committed to PV, which means we could continue with our work and I very much hope we will be rewarded for this.

Do you feel that we are in a new investment cycle for PV manufacturing equipment?

For sure, we do see that. And it is not just Schmid, but other suppliers are reporting a revival within the equipment industry and expansions in production capacity. Some of the big expansions are on our radar, such as Hanwha Q Cells in Korea, and I do believe that these announcements are really happening.

There have been a lot of expansion announcements over the last three years that never actually happened. But orders are really coming in for expansion plans and I really do believe they are going to happen. ♦

Interview by **pv magazine** staff